What is claimed is:

1. A method of making a ceramic fiber composite comprising:

forming a green substrate from components comprising ceramic fibers;

impregnating the green substrate with a first impregnation dispersion to provide an impregnated substrate, wherein the first impregnation dispersion comprises water, a nanoclay, and at least one of a ceramic precursor material or a ceramic material;

drying the impregnated substrate to provide a dried substrate;

calcining the dried substrate to form a calcined substrate; and

firing the calcined substrate to form a ceramic fiber composite comprising ceramic fibers bonded together by an at least partially ceramic binder, wherein the ceramic fiber composite has a porosity of less than 65 percent.

2. A method according to claim 1, wherein the green substrate is formed from components comprising ceramic fibers and an organic binder material.

3. A method according to claim 1, wherein the at least partially ceramic binder comprises chemically stabilized β-crystobalite.

4. A method according to claim 1, wherein the chemically stabilized β-crystobalite comprises calcium.

5. A method according to claim 1, further comprising impregnating a second dispersion into at least one of the dried, calcined, or fired substrates, wherein the second dispersion comprises at least one of a ceramic precursor material or a ceramic material.

6. A method according to claim 5, wherein the second dispersion further comprises at least one of a catalyst or a nanoclay.

7. A method according to claim 1, further comprising perforating the dried substrate.

8. A method according to claim 1, further comprising perforating the ceramic fiber composite.

9. A method according to claim 1, wherein the ceramic particles comprise an oxide of at least one of aluminum, zirconium, or silicon.

10. A method according to claim 1, wherein the first impregnation dispersion further comprises a surfactant.

11. A method according to claim 10, wherein the surfactant is ionic.

12. A method according to claim 1, wherein the first impregnation dispersion further comprises a viscosity modifier.

13. A method according to claim 1, wherein the porosity of the ceramic fiber composite is less than 60 percent.

14. A method according to claim 1, wherein the porosity of the ceramic fiber composite is less than 40 percent.

15. A method according to claim 1, wherein the porosity of the ceramic fiber composite is less than 20 percent.

16. A method according to claim 1, further comprising at least one of molding or shaping the green substrate.

17. A method according to claim 1, wherein the first impregnation dispersion comprises at least one of a metal oxide or a metal oxide precursor.

18. A method according to claim 17, wherein at least one the metal oxide or the metal oxide precursor is colloidal.

19. A method according to claim 1, wherein the first impregnation dispersion comprises silicon carbide.

20. A method according to claim 19, wherein the first impregnation dispersion further comprises at least one of colloidal boehmite, colloidal zirconia, or colloidal silica.

21. A ceramic fiber composite comprising ceramic fibers bonded together by an at least partially ceramic binder, wherein the at least partially ceramic binder comprises chemically stabilized β-crystobalite, and wherein the porosity of the ceramic fiber composite is less than 65 percent.

22. A ceramic fiber composite according to claim 21, wherein the chemically stabilized β-crystobalite comprises calcium.

23. A ceramic fiber composite according to claim 21, wherein the ceramic fibers have an average length in a range of from 3 millimeters to 50 millimeters.

24. A ceramic fiber composite according to claim 21, wherein the volume of the ceramic fibers is in a range of from 20 percent to 25 percent of the total volume of the ceramic binder and ceramic fibers.

25. A ceramic fiber composite according to claim 21, further comprising perforations extending through the ceramic fiber composite.

26. A ceramic fiber composite according to claim 21, wherein the perforations comprise less than 20 percent of the area of the surface of the ceramic fiber composite.

27. A ceramic fiber composite according to claim 21, wherein the perforations comprise at least one of slits or circular holes.

28. A ceramic fiber composite according to claim 21, wherein the ceramic fiber composite is substantially planar.

29. A ceramic fiber composite according to claim 21, wherein the ceramic fiber composite is nonplanar.

30. A ceramic fiber composite according to claim 21, wherein the ceramic fiber composite has a shape selected from the group consisting of a cone, a sheet, a cylinder, and a thimble.

31. A burner comprising a ceramic fiber composite according to claim 21.

32. A burner according to claim 31, wherein the chemically stabilized β-crystobalite comprises calcium.

33. A burner according to claim 31, further comprising perforations extending through the ceramic fiber composite.

34. A burner according to claim 33, wherein the perforations comprise less than 20 volume percent of the ceramic fiber composite.

35. A burner according to claim 31, wherein the burner is a radiant burner.

36. A burner according to claim 31, wherein the burner is a blue flame burner.

37. A burner according to claim 31, wherein the ceramic fiber composite has a shape selected from the group consisting of a cone, a sheet, a cylinder, and a thimble.